

In th Claim :

Please cancel claims 1-16

Remaining claims are 17-39.

17. A method of making comprising the steps of:
 - making a read head including the steps of:
 - forming a read sensor;
 - forming first and second lead layers with the first and second lead layers connected to the read sensor;
 - forming nonmagnetic insulative first and second read gap layers with the read sensor and the first and second lead layers located between the first and second read gap layers;
 - forming ferromagnetic first and second shield layers with the first and second read gap layers located between the first and second shield layers and the first read gap layer having a resistance R_{G1} between the first shield layer and one of the first and second lead layers and the second read gap having a resistance R_{G2} between the second shield layer and said one of the first and second lead layers;
 - forming a connection via a plurality of resistors between a first node and each of the first and second shield layers wherein the plurality of resistors includes at least first and second resistors R_{G1} and R_{G2} , the first node is connected to said one of the first and second lead layers and a second node is located between the first and second resistors R_{S1} and R_{S2} ; and
 - connecting first and second inputs of an operational amplifier to the first and second nodes respectively so as to be across the first resistor R_{S1} and connecting an output of the operational amplifier to the first node for maintaining the first and second nodes at a common voltage potential.
18. A method of making as claimed in claim 17 including making the sensor and the first and second resistances R_{S1} and R_{S2} coplanar.

19. A method of making as claimed in claim 18 wherein the step of making the sensor and the first and second resistances R_{S1} and R_{S2} coplanar includes the steps of:

simultaneously depositing a single layer of material for the sensor and the first and second resistances R_{S1} and R_{S2} ; and

simultaneously patterning said single layer of material to form the sensor and the first and second resistances R_{S1} and R_{S2} .

20. A method of making as claimed in claim 17 including:

connecting a first side of a test instrument for enabling a determination of resistance to the first node and connecting a second side of the test instrument to at least one of the first and second shield layers.

21. A method of making as claimed in claim 20 including:

shorting the first and second shield layers together; and

connecting the second side of the test instrument to each of the first and second shield layers.

22. A method of making as claimed in claim 21 including making the sensor and the first and second resistances R_{S1} and R_{S2} coplanar.

23. A method of making as claimed in claim 22 wherein the step of making the sensor and the first and second resistances R_{S1} and R_{S2} coplanar includes the steps of:

simultaneously depositing a single layer of material for the sensor and the first and second resistances R_{S1} and R_{S2} ; and

simultaneously patterning said single layer of material to form the sensor and the first and second resistances R_{S1} and R_{S2} .

24. A method of making as claimed in claim 23 further comprising the

steps of:

making a write head including the steps of:

forming ferromagnetic first and second pole piece layers with a yoke portion between a pole tip portion and a back gap portion;

forming a nonmagnetic write gap layer between the pole tip portions of the first and second pole piece layers;

forming an insulation stack with at least one coil layer embedded therein located between the yoke portions of the first and second pole piece layers; and

connecting the first and second pole piece layers at their back gap portions.

25. A method of making as claimed in claim 24 wherein the second shield layer and the first pole piece layer are formed as a common layer.

26. A method of making as claimed in claim 24 wherein the second shield layer and the first pole piece layer are formed as separate layers; and

forming a nonmagnetic insulative isolation layer between the second shield layer and the first pole piece layer.

27. A method of making as claimed in claim 17 including:

the second resistor R_{S2} further being connected between the second node and the second shield layer; and

connecting a third resistor R_{S3} between the second node and the first shield layer.

28. A method of making as claimed in claim 27 including making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} coplanar.

29. A method of making as claimed in claim 28 wherein the step of making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} includes the steps of:

simultaneously depositing a single layer of material for the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} ; and

simultaneously patterning said single layer of material to form the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} .

30. A method of making as claimed in claim 27 including:

connecting a first side of a test instrument for enabling a determination of resistance to the first node and connecting a second side of the test instrument to the first shield layer.

31. A method of making as claimed in claim 30 including making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} coplanar.

32. A method of making as claimed in claim 31 wherein the step of making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} includes the steps of:

simultaneously depositing a single layer of material for the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} ; and

simultaneously patterning said single layer of material to form the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} .

33. A method of making as claimed in claim 32 wherein the second shield layer and the first pole piece layer are formed as a common layer.

34. A method of making as claimed in claim 32 wherein the second shield layer and the first pole piece layer are formed as separate layers; and

forming a nonmagnetic insulative isolation layer between the second shield layer and the first pole piece layer.

35. A method of making as claimed in claim 27 including:
connecting a first side of a test instrument for enabling a determination of resistance to the first node and connecting a second side of the test instrument to the second shield layer.
36. A method of making as claimed in claim 35 including making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} coplanar.
37. A method of making as claimed in claim 36 wherein the step of making the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} includes the steps of:
simultaneously depositing a single layer of material for the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} ; and
simultaneously patterning said single layer of material to form the sensor and the first, second and third resistances R_{S1} , R_{S2} and R_{S3} .
38. A method of as claimed in claim 37 wherein the second shield layer and the first pole piece layer are formed as a common layer.
39. A method of making as claimed in claim 37 wherein the second shield layer and the first pole piece layer are formed as separate layers; and
forming a nonmagnetic insulative isolation layer between the second shield layer and the first pole piece layer.